

REMARKS

This communication is responsive to the FINAL Office Action of July 12, 2005 in which the following objections were raised: [2-3] Claims 1-9, 17-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (USP 5,742,527) in view of Bloy et al. (USP 4,695,825).

Applicant has canceled Claims 8, 10-16, and 18-20 and amended all remaining Claims 1-7, 9, 17.

2-3. CLAIMS 1-9, 17-20 REJECTED UNDER 35 U.S.C. 103(A)

[2-3] Claims 1-9, 17-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rybicki et al. (USP 5,742,527) in view of Bloy et al. (USP 4,695,825).

Rybicki reference

The Examiner has characterized the Rybicki reference as disclosing an ADSL transceiver configured to couple to a communication medium to communicate frequency division multiplexed upstream and downstream portions of at least one multi-tone modulated communication channel thereon, and the ADSL transceiver comprising a DSP. The Applicant concurs with that statement to the limited extent recited herein.

The Examiner further characterized the Rybecki reference as teaching a DSP configured to select a processing interval inversely corresponding with bandwidth availability on the communication medium and the Applicant respectfully rejects this later characterization of the Rybecki reference.

The Rybicki reference teaches a pair of modems, one at the central office and one remote, which simultaneously support both ISDN communications and echo cancelled ADSL communications. To avoid what would otherwise be overlap between the upstream ADSL signal and the ISDN signal the modem has been designed to transport the upstream ADSL signal from the remote modem to the CO at frequencies above the ISDN band by the remote

modem and then folded back into the traditional ADSL band by the receiver of the CO modem. Both the original and image occupy the same 138kHz frequency range, both contain identical information, and both have the same tone spacing as specified by the ADSL which is 32 tones at 4.3 kHz tone spacing. Nowhere does the Rybicki reference teach a transceiver which varies tone spacing to conform with the bandwidth available on a subscriber line, and nowhere does Rybicki teach a DSP operable to determine during a training phase of operation the bandwidth availability of a subscriber line and to expand or contract the tone spacing used to modulate and demodulate a communication channel thereon accordingly. These limitations are found in the Applicant's amended independent Claims 1 and 17 and by extension to all remaining Claims dependent thereon.

“...a digital signal processor (DSP) configured to couple to the at least one subscriber line for multi-tone modulation and demodulation of the at least one communication channel thereon, and the DSP operative during a training phase of the at least one multi-tone modulated communication channel to determine an available bandwidth on the at least one subscriber line and to expand or contract a tone spacing of the multi-tone modulation and demodulation of the at least one communication channel responsive to the determination to conform with the available bandwidth on the at least one subscriber line; whereby the tone spacing utilized for modulation and demodulation of the at least one subscriber line vary at least in part based on a length of the at least one subscriber line. ” (Applicant's amended Claim 1, emphasis added)

“..determining during a training phase of the at least one multi-tone modulated communication channel an available bandwidth on the at least one subscriber line;

selecting a tone spacing for each successive set of tones associated with the modulation and demodulation of the at least one multi-tone modulated communication channel responsive to the available bandwidth determined in the determining act whereby the tone spacing utilized for modulation and demodulation of the at least one subscriber line varies at least in part based on a length of the at least one subscriber line.” (Applicant's amended Claim 17, emphasis added)

The Applicant's claimed limitations are supported throughout the specification including: Figure 7 and the associated specification “*In decision process 706 a determination is*

made for both the CO and subscriber modem units as to whether expanded tone spacing is supported. If expanded tone sets are supported control passes to process 708. In process 708 the spacing of the expanded tone set is established by setting the processing interval for each of the symbol/tone sets for that channel at an integer fraction or multiple of the standard processing interval of 250 microseconds. Control then passes to process 710 in which the training for the channel is effected. Then in process 712 the channel is characterized for each tone in the tone set. Next in decision process 714 a determination is made as to whether the subscriber loop which carries the channel qualifies for high data rates associated with an expanded tone spacing. If not control passes to process 720. If the channel's subscriber line loop qualifies as a short haul line/channel which supports the expanded tone spacing then control passes to process 730 in which state information is exchanged between the CO and subscriber modems." (Applicant's Specification at page 18, lines 6-18) " FIGS. 3 A-B are signal diagrams showing a common set of DMT tones with a standard tone spacing 300 of 4.3125 kHz (See FIG. 3A) and an expanded tone spacing of 8.625 kHz (See FIG. 3B). The variation in tone spacing is achieved by varying the processing periodicity for successive symbol/tone sets from the X-DSL standard of 250 microseconds per symbol per tone set to 125 microseconds per symbol per tone set for each channel. "
(Applicant's Specification at page 14, lines 3-8)

Bloy Reference

The Examiner has characterized the Bloy reference as teaching an analog to digital conversion system which teaches an inverse relationship of the processing interval, rate and bandwidth. The Applicant of course acknowledges the corollary to the well know Nyquist equation and beyond that is at a loss to determine the relevance of the Bloy reference to this prosecution, since that reference teaches none of the Applicant's claimed limitations.

As discussed above neither the Rybicki reference nor the Bloy reference singly or in combination teach or disclose any of the Applicant's claimed limitations found in amended Independent Claims 1, 17. The Applicant therefore respectfully requests that the Examiner withdraw the rejection of these Claims. Remaining Claims 2-7 and 9 depend from corresponding ones of Independent Claims 1, 17 and are thus also believed to have been amended to overcome the references for the reasons discussed above and for other reasons of independent significance. The Applicant therefore respectfully requests that the Examiner withdraw the rejection of these Claims as well.

CONCLUSION

In view of the above remarks, and the amendments to the Claims, Applicant respectfully submits that all remaining Claims 1-7, 9, 17 have been placed in a condition for allowance, and requests that they be allowed. Early notice to this effect is solicited.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 50-1338 (Docket No. VELCP010X1).

Respectfully submitted,
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